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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/035,032

12/27/2001

Akihiro Funamoto

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10/28/2003

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,032

Applicant(s)

FUNAMOTO ET AL.

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment, Paper No. 9, filed July 21, 2003.

Accordingly, claims 1 and 21 were amended, claim 2 was cancelled, and new claim 22 was added. Currently, claims 1 and 3-22 are pending in this application.

2. The indicated allowability of claims 2, 3 and 5 from the last office action is withdrawn in view of the newly discovered reference(s) to USPN 5,841,496 of Itoh et al.. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-13 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al. (JP 10-268306) in view of Itoh et al. (USPN 5,841,496).

As shown in Fig. 1, Takei discloses a reflection type display apparatus comprising:

a reflection type display panel 10 having a reflection plane 20 used to reflect thereon light entered from a forward direction; and

a forward lightening apparatus 30, 32 arranged in front of said reflection type display panel; wherein:

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light B which is entered from said forward lightening apparatus into said reflection type display panel is entered into said reflection type display panel along a direction different from a direction of external light A entered into said reflection type display panel; and

both the light B which is derived from said forward lightening apparatus and is reflected on said reflection plane, and said external light A which is reflected on said reflection plane are projected along the substantially same reflection direction,

wherein said reflection plane owns substantially no such a region located in parallel to a front surface of said reflection type display panel,

wherein both a luminance center of light which is derived from said forward lightening apparatus and is reflected on said reflection plane, and another luminance center of external light which is reflected on said reflection plane are collected at a predetermined position in front of said reflection type display panel;

wherein said forward lightening apparatus is comprised of a light source 32 for projecting light; and a light conducting plate 30 for confirming incident light in the own light conducting plate and for propagating said confined light through the own light conducting plate (paragraphs 39 and 40),

wherein a thickness of an edge portion of said light conducting plate, which is located far from said light source, is made thinner than a thickness of a portion of said light conducting plate, which is located in the vicinity of said light source (paragraphs 33 and 34) and both a front surface and a rear surface of

said light conducting plate are formed under smooth condition (paragraphs 33 and 36);

wherein a front surface of said light conducting plate is made smooth; and a pattern inclined in such a manner that a thickness of said light conducting plate on the side located far from said light source becomes thin is repeatedly formed on a rear surface of said light conducting plate (paragraphs 33 and 34), and

wherein a rear surface of said light conducting plate is optically adhered to said reflection type display panel; and a low refractive index layer 31 is formed between said light conducting plate and said reflection type display panel, the reflective index of said low refractive index layer being larger than a refractive index of air and smaller than a refractive index of said light conducting plate (paragraphs 38 and 48-50); and wherein a thickness of said light conducting plate becomes thin in accordance with a position where said light conducting plate reaches close to said light source within a region close to the light source, and wherein said forward lightening apparatus is comprised of a light source 32 for projecting light; and a directivity controlling unit 30, 34 for controlling directivity of light projected from said light source.

With respect to claim 22, Takei et al. also discloses a light reflecting method comprising:

a step for entering light B which is entered from said forward lightening apparatus 30, 32 into said reflection type display panel 10 along a direction different from a direction of external light A entered into said reflection type display panel 10; and

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a step for projecting both the light B which is derived from said forward lightening apparatus and is reflected on said reflection plane 20, and said external light A which is reflected on said reflection plane 20 along the substantially same reflection deflection.

Takei et al. discloses a reflection type display apparatus that is basically the same as that recited in claims 1, 3-13 and 22 except that said reflection plane is not subdivided into both a first region capable of reflecting thereon light which is obliquely entered from said forward lightening apparatus along said reflection direction, and a second region capable of reflecting thereon external light which is entered at a substantially right angle along said reflection direction. As shown in Fig. 29, Itoh et al. discloses a reflective liquid crystal device comprising a reflection plane 31 in which convex and concave portions are provided for each of reflection surfaces, thereby forming a number of fine reflection surfaces on the reflection plane, wherein light entering from different directions (broken lines with different oblique and right angles) is regularly reflected towards the user along the substantially same reflection direction (solid arrows) so as to obtain an even display with high brightness (col. 29, lines 51-61). Also, Fig. 13 of Itoh et al. discloses a normal line (broken line) on an inclined plane of said concave/convex portions at points p and q is inclined from a direction perpendicular to the reflection plane. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reflection type display apparatus of Takei et al. with the teaching of Itoh et al. by forming a reflection plane subdivided into both a first region capable of reflecting thereon light which is obliquely entered from said forward lightening apparatus along said reflection direction, and a

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second region capable of reflecting thereon external light which is entered at a substantially right angle along said reflection direction so as to obtain high brightness for the display.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al. (JP 10-268306) in view of Itoh et al. (USPN 5,841,496) as applied to claims 1, 3-13 and 22 above and further in view of Ishitaka (USPN 6,233,031 B1).

The reflection type display apparatus of Takei et al. as modified in view of Itoh et al. above includes all that is recited in claim 14 except for a method for producing the reflection plane. As shown in Figs. 2-5, Ishitaka discloses a method for producing a reflection plane, by which method the shape of a fine uneven pattern provided for the reflection plane can be controlled so that the resulting reflector has an excellent reflection efficacy (col. 2, lines 1-6), wherein: ultraviolet hardening type resin 40 is supplied onto a board 12; and under such a condition that said ultraviolet hardening type resin is sandwiched between a stamper 42 having an inverted pattern 41 of a reflection plane and said board, ultraviolet rays are irradiated to said ultraviolet hardening type resin so as to harden the ultraviolet hardening type resin, and then to transfer the inverted pattern of said stamper to said ultraviolet hardening type resin (col. 5, lines 20-31). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the method of Ishitaka for producing a reflection plane with excellent reflection efficacy.

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6. Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al. (JP 10-268306) in view of Itoh et al. (USPN 5,841,496) as applied to claims 1, 3-13 and 22 above and further in view of Funahata et al. (USPN 6538711 B2).

With respect to claim 15, the reflection type display apparatus of Takei et al. as modified in view of Itoh et al. above includes all that is recited in claim 15 except for a method for producing the reflection plane. As shown in Figs. 2A and 2B, Funahata et al. discloses a method for providing a reflection plane, which can be done easily and immediately and is quite advantageous to lowering cost, wherein: under such a condition that resin 2 supplied onto a board 1 has not yet been hardened, or is softened, said resin is sandwiched between a stamper 19 having an inverted pattern of a reflection plane and said board and then is depressed by press 20 so as to transfer the inverted pattern of said stamper to said resin (col. 8, line 45 through col. 9, line 7). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the method of Funahata for producing a reflection plane with low cost.

With respect to claims 17-21, Funahata et al. also discloses that the reflection type display apparatus is preferably suitable to be used in a hand-held personal computer (PC), a notesized PC, a mini notesized PC, a TV set, a personal digital assistant (PDA) terminal, or the like, or a large-sized LCD for a monitor (col. 14, lines 46-50). Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the reflection type display apparatus connected to an electronic circuit in a portable telephone, a portable information

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terminal, a television, or an electronic appliance as intended use so as to obtain a display with a reflective mode.

Finally, with respect to claim 16, it is well known in the art that a reflection type liquid crystal display panel produces an image by utilizing a characteristic of a liquid crystal layer sealed within the display panel.

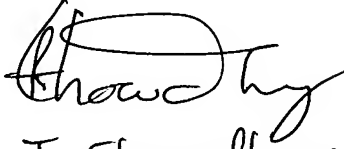
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong

10/14/2003


T. Choudhury
Primary Examiner